
Health Care Utilization

Cross-Border Utilization of Health Care: Evidence from a Population-Based Study in South Texas

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Objective. To assess the prevalence of health care utilization in Mexico by Texas border residents and to identify the main contributing factors to their cross-border utilization of health care services.

Data and Methods. This study used primary data from a population-based telephone survey that was conducted in the whole Texas border area in 2008. The survey included responses from 1,405 adults. Multivariate logistic regression models were estimated to determine predictors of utilizing a wide range of health care services in Mexico.

Principal Findings. Forty-nine percent of the sample reported having ever purchased medications in Mexico, followed by 41 percent for dentist visits, 37.3 percent for doctor visits, and 6.7 percent for inpatient care. The most significant predictors of health care utilization in Mexico were lack of U.S. health insurance coverage, dissatisfaction with the quality of U.S. health care, and poor self-rated health status.

Conclusions. The high prevalence of use of health care services in Mexico by Texas border residents is suggestive of unmet needs in health care on the U.S. side of the border. Addressing these unmet needs calls for a binational approach to improve the affordability, accessibility, and quality of health care in the U.S.–Mexico border region.

Key Words. Health care utilization, uninsurance, U.S.–Mexico border, cross-border utilization

Access to health care is particularly challenging for U.S. residents living along the U.S.–Mexico border, a vast area extending from San Diego, California, to Brownsville, Texas. A significant barrier to health care access lies in the economic deprivation to which the border area has long been exposed, as indicated by exceedingly high rates of poverty and uninsurance. About 47 percent of the residents in the 32 border counties in Texas lived below 150 percent of the federal poverty line in 2000, compared with the U.S. national average of 21 percent. An even more alarming gap exists in health insurance coverage, with Texas border counties having an estimated uninsurance rate of

42 percent in 2002, compared with the national average of 15 percent (U.S. Department of Health and Human Services 2007).

In light of these economic, financial, and health care access barriers, a sizable proportion of border residents resort to Mexico to meet their health care needs—with much more affordable prescription medications as well as services from dentists and doctors. Results from two congressional reports on drug price differences between the United States and Mexico showed that the average drug price in the United States ranged from 95 to 102 percent higher than in Mexico (U.S. House of Representatives 1998, 1999). This substantial price gap has motivated many U.S. border residents to go to Mexico to buy prescription medications without a prescription, trusting the free medical advice routinely offered at Mexican pharmacies (Rivera, Ortiz, and Cardenas 2009). Clearly, these patterns of cross-border health care utilization reflect major unmet needs on the U.S. side of the border. It would be difficult to address these unmet needs without understanding the contributing factors to cross-border utilization of Mexican care by U.S. border residents.

Previous studies have documented the utilization of health care services in Mexico by U.S. border residents (Macias and Morales 2001; Seid et al. 2003; Escobedo and Cardenas 2006; Fernández and Amastae 2006; Bastida, Brown, and Pagán 2007, 2008; Rivera, Ortiz, and Cardenas 2009; Wallace, Mendez-Luck, and Castañeda 2009). A consistent finding from these studies is that lack of health insurance coverage is one of the most significant predictors of cross-border utilization of health care services. Because of data limitations, however, extant research is primarily based on small, nonrandom, local samples that target specific health care services (Bastida, Brown, and Pagán 2008), making it difficult to generalize findings beyond the selected study areas or population groups.

In this study, we seek to contribute to the literature on the utilization of Mexican health care services by U.S. border residents by analyzing data from a population-based, random sample survey that covers 32 border counties in Texas. Specifically, our study has two aims: (1) to assess the use of different types of health care services in Mexico by Texas border residents; (2) to

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identify the contributing factors to utilizing specific health care services in Mexico, including medication purchases, doctor and dentist visits, and inpatient care by Texas border residents. Besides health insurance status, we also analyze the impact of demographics, education, income, cultural affinity with Mexico, self-rated health status, and the perceived quality of health care received in the United States. This multivariate approach allows us to single out the most significant predictors of cross-border utilization of health care services among a range of theoretically relevant factors.

METHODS

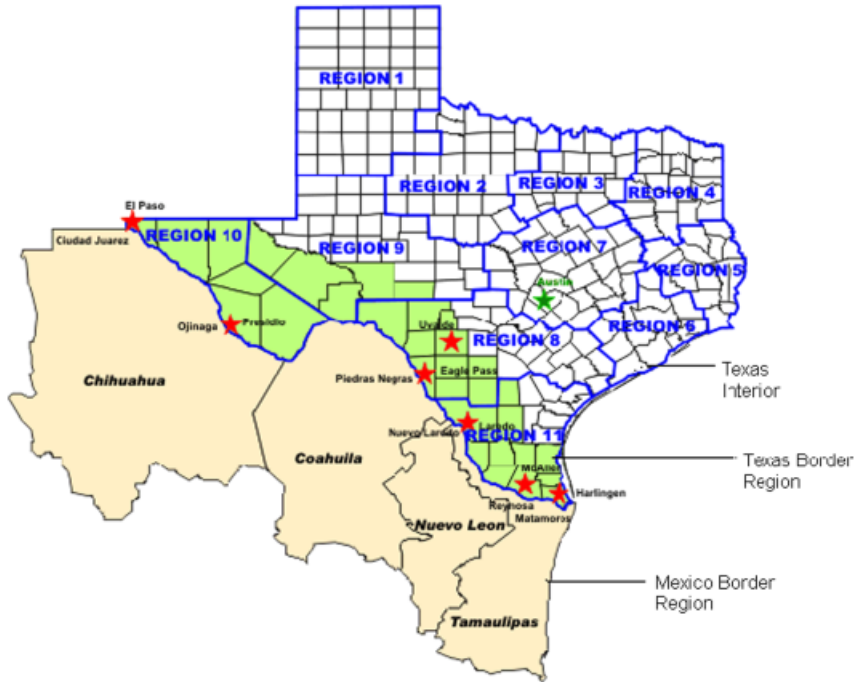
Data

Data used in this study come from the Cross-Border Utilization of Health Care Survey, a population-based telephone survey conducted in the Texas border area in the spring of 2008. As indicated in Figure 1, the study area includes 32 border counties in Texas, defined by the U.S.–Mexico Border Health Commission as all counties within 62 miles (100 km) of the border. This area had a population of 2.3 million in 2005, with most residents being of Mexican origin (U.S. Census Bureau 2009).

Telephone interviews were conducted with 1,405 respondents 18 years of age or older at the time of the survey. An additional 200 interviews were conducted in two nonborder counties (Harris and Bexar) to compare health care utilization patterns between border and non-border residents, but these cases are not included here. In the survey, we asked a range of questions regarding sociodemographic background, acculturation, and health care utilization practices in both Mexico and the United States. Except for household income, few missing values were reported.

The data collection utilized a random digit dial (RDD) sampling frame that included both listed and unlisted telephone numbers from working blocks¹ of numbers in the study area. This approach provides a near 100 percent coverage of all households with landlines. The RDD sample was randomly generated by deriving unique blocks based on area code, exchange, and the fourth and fifth digits of known telephone numbers. Each number was purged against known business listings and predialed to purge listed non-working numbers, and 85–90 percent of nonproductive numbers. This screening ensures that a high percentage of numbers in the sample are working residential numbers, thereby increasing the productivity of the sample and decreasing nonresponse.

Figure 1: The Study Area—32 Border Counties in South Texas



The overall response rate was 28.6 percent. This rate was calculated based on the Response Rate 4 (RR4) standards adopted by the American Association for Public Opinion Research (AAPOR), which reflects the percentage of the total number of complete and partial interviews out of the total number of attempted dialed calls in conjunction with a detailed classification of their eligibility status (AAPOR 2009). The response rate of this study is comparable to several recent studies that also used data collected from telephone surveys (Stephenson et al. 2007; Elliott et al. 2009; Palaniappan et al. 2009). The response rates (AAPOR RR4) for these studies were 30, 27, and 31.3 percent, respectively. As a further comparison point, the overall response rate for the 2009 Behavioral Risk Factor Surveillance System (the largest telephone health survey in the United States) in Texas was 29.4 percent (the overall response rate across states ranged from 19.2 to 61.8 percent) (Centers for Disease Control and Prevention [CDC] 2010). Moreover, several studies have indicated that the association between response rates and response biases is relatively weak in health surveys (e.g., Triplett 2002; Blumberg et al. 2005; Holle et al. 2006).

The relatively low-response rate in this study could have been related to the presence of two unique demographic groups in the Texas border region: Winter Texans and undocumented immigrants. Winter Texans are a large group of seasonal migrants (mostly retirees) who usually come to live in the Rio Grande Valley during the winter months each year. By the time when the Cross-Border Utilization Survey was conducted (April and May of 2008), many Winter Texans could have already left the region, yet their residential telephone numbers could have been still active, which would have an effect on the response rate. Moreover, the significant concentration of undocumented immigrants in the region implies that these immigrants might be unwilling to participate in any kind of surveys for fear of being identified and eventually deported. This, in turn, would also negatively influence the response rate.

Measures

Utilization of health care services in Mexico by Texas border residents was classified into five categories: medication purchases, doctor visits, dental visits, inpatient care, and utilization of at least one of these four types of care. Medication purchases in Mexico were mainly captured by two questions in the survey: (1) Have you ever bought medications from Mexico? and (2) (for those who replied yes) When was the last time you bought medications from Mexico (year and month)? Based on the answers to the second question, we were also able to calculate the percentage of the respondents who reported purchasing medications in Mexico within 12 months before the survey.² Two similar questions were also asked for doctor visits, dentist visits, and inpatient care.

We related respondents' use of health care services in Mexico to a set of explanatory variables. Conceptually, what we are analyzing is the level of substitution between two products and services—U.S. and Mexican health care. Relative prices, in both monetary and nonmonetary terms, presumably would affect the level of substitution across these products and services. For example, having U.S.-based health insurance coverage is supposed to facilitate access to health care services in the United States while reducing the need to utilize health care services in Mexico. At the same time, the presence of lower-cost health services in Mexico could well motivate Texas border residents to forgo health insurance coverage offered on the U.S. side of the border. Based on this conceptual framework, our explanatory variables included household income, health insurance coverage, fluency in Spanish, self-rated health status, perceived quality of health care services received in the United States, and

demographic variables (age, gender, race and ethnicity, education, marital status, and citizenship status).

In our analysis, race and ethnicity were classified into four categories: non-Hispanics, Hispanics born in the United States, Hispanics born in Mexico, and Hispanics born in countries other than the U.S. and Mexico. This classification scheme captures some of the variation in acculturation in the sense that holding other characteristics equal, Hispanics born in Mexico are presumably more acculturated into the Mexican health care system than those born in the United States and other countries. Similarly, fluency in Spanish can also be a valuable indicator of cultural affiliation with Mexico.

Our model also included the perceived quality of health care services received in the United States. This factor is particularly relevant because U.S. residents in the border communities would usually weigh the relative costs and benefits of using care from either side of the border in light of their personal situations and preferences. In the survey, respondents were asked, "Overall, how satisfied are you with the health care services you have had in the U.S.?" The responses were coded into five categories including "very unsatisfied," "unsatisfied," "neutral," "satisfied," and "very satisfied."

Statistical Analysis

We first assessed the prevalence of using each of the four types of health care services in Mexico, as well as the utilization of at least one of the four types of services. We calculated two sets of percentages and their standard errors, with the first set pertaining to ever using these services and the second set targeting the use of services within 12 months before the survey. This allowed us to estimate two different kinds of prevalence rates: an overall prevalence that takes into consideration all previous cross-border utilization of health care services in Mexico, and a more recent prevalence rate that focuses on utilization of health care services within 12 months before the survey.

Among the 1,405 respondents in the sample, 15.8 percent did not report their household income. The annual household income for these respondents was imputed based on a regression of household income as a function of all the other explanatory variables. The new variable on household income was then used as an explanatory variable in our analysis.³

We then estimated five logistic regressions—one for each of the four types of health care services as dependent variables, and a fifth regression analyzing the use of at least one of the four types of health care services. All of these dependent variables were defined under the category of ever used a

service or not. We replicated the analysis after switching the dependent variables from “ever used” to “used within 12 months prior to the survey” and found that the results remained largely unchanged (in this second set of regressions we were not able to reliably estimate the inpatient care models because the number of users was very small).

All estimates were conducted using sampling weights. The weighting of the data utilized a raking procedure to improve the reliability of the survey estimates. Specifically, raking adjustments were used to align the weighted sample to the known adult population distribution in the study area based on information from the 2008 American Community Survey. The variables used for raking included age, gender, ethnicity, nativity, and education. Hence, the weighted sample came very close to the population in terms of the distribution of these selected variables.

RESULTS

A Description of the Sample

The characteristics of the respondents in the sample were summarized in Table 1. Among the 1,405 respondents, 17.3 percent were non-Hispanics. About 54 percent were Mexico-born Hispanics and 28.1 percent were Hispanics born in the United States. Over 82 percent of the respondents reported good or very good fluency in Spanish. About half of the sample reported their annual household income to be <U.S.\$20,000. Concurrent with poverty, 47 percent of the respondents reported no health insurance coverage at the time of the survey. About a quarter of the respondents rated their health to be fair or poor and roughly 10 percent of the sample expressed dissatisfaction with the health care services received on the U.S. side of the border.

How Common Is It for Texas Border Residents to Utilize Health Care Services in Mexico?

Utilizing health care services in Mexico is fairly common among residents of the Texas border area, as indicated by the percentage distribution in Table 2. The most widely utilized service was medication purchases, with 49.3 percent of respondents reporting having ever purchased medications in Mexico and 43.3 percent of respondents reporting purchases within 12 months before the survey. Forty-one percent of the sample had ever visited a doctor in Mexico and 36.9 percent reported doctor visits within 12 months before the survey.

Table 1: A Description of the Sample (Mean or Percentage)

Age	44.7	Annual household income (U.S.\$)*	
Gender		< 10,000	22.2
Male	46.5	10,000–19,999	29.8
Female	53.5	20,000–49,999	27.1
Race and ethnicity		50,000–79,999	13.2
Non-Hispanics	17.3	80,000–124,999	4.9
Hispanics born in the United States	28.1	125,000 and above	2.7
Hispanics born in Mexico	54.1	Health insurance status	
Hispanics born somewhere else	0.5	Insured	53.0
Marital status		Uninsured	47.0
Married	57.1	Self-rated health status	
Single	26.3	Excellent	18.0
Divorced	6.9	Very good	20.7
Separated	2.3	Good	36.3
Widow(er)	7.4	Fair	18.8
Education		Poor	6.3
Below high school	31.0	Satisfaction with health	
High school or above	69.0	care received in the United States	
Citizenship status		Very satisfied	27.2
U.S. citizen	51.3	Satisfied	43.9
Non-U.S. citizen	48.7	Neutral	18.5
Fluency of Spanish		Unsatisfied	6.3
Very good	54.4	Very unsatisfied	4.1
Good	28.3		
Not good	9.0		
Do not speak	8.3		

Note. Their annual household income was imputed based on information on age, gender, race and ethnicity, marital status, education, citizenship, fluency of Spanish, health insurance status, self-rated health status, and satisfaction with care received in the United States.

*Among 1,405 respondents who participated in the survey, 223 of them did not report information on income.

Source: The Cross-Border Utilization of Health Care Survey ($N = 1,405$).

Another service commonly utilized in Mexico by Texas border respondents is dental care, with 37.3 percent of the sample reporting ever visiting a Mexican dentist. The percentage, however, becomes substantially reduced when it comes to visiting a Mexican dentist within 12 months before the survey, with 24.2 percent indicating such utilization. By contrast, inpatient care was rarely utilized in Mexico. Only 6.7 percent of the sample reported ever using inpatient care in Mexico, and 4 percent reported use of such care within the 12 months before the survey.

Overall 63.4 percent of respondents in the sample reported ever using at least one of the four types of health care services in Mexico. The corresponding percentage becomes 50.5 percent in the case of using any of the services

Table 2: Use of Health Care Services in Mexico by Texas Border Residents (%)

<i>Health Care Services</i>	<i>Ever Used the Service</i>	<i>Used the Service within 12 Months before the Survey</i>
Purchase medications	49.3 (1.3)	43.3 (1.3)
Visit a doctor	41.0 (1.3)	36.9 (1.3)
Visit a dentist	37.3 (1.3)	24.2 (1.1)
Have inpatient care	6.7 (0.7)	4.0 (0.5)
Have at least one of the four types of care	63.4 (1.3)	50.5 (1.3)

Note. Numbers in the parentheses are standard errors.

Source: The Cross-Border Utilization of Health Care Survey ($N = 1,405$).

within 12 months before the survey. This means that for at least half of the sample, medical services from Mexico constitute an important source of care, and these residents tend to utilize the services more frequently than the rest of the border population in Texas.

What Factors Predict the Utilization of Health Care Services in Mexico by Texas Border Residents?

Demographic factors such as age and gender made a significant difference in the likelihood of crossing the border to obtain health care services in Mexico. Older respondents were less likely to visit a doctor but more likely to visit a dentist in Mexico. For all the health care services considered, females had a much higher chance of utilizing health care services in Mexico than males ($p < .001$).

Marital status was closely related to the utilization of two types of health care services in Mexico: medication purchases and dentist visits. Divorced respondents were more likely than married ones to purchase medications ($p < .001$) or to visit a dentist in Mexico ($p < .001$). For respondents who survived their spouses, however, the likelihood of utilizing these two types of health care services in Mexico turned out to be much lower compared with that of married respondents ($p < .01$ in both cases).

Cultural affinity with Mexico was associated with a substantially higher chance of utilizing health care services there. Relative to non-Hispanics, Hispanics who were born in Mexico were far more likely to visit a Mexican dentist ($p < .001$). There was also a patterned relationship between fluency in Spanish and the utilization of Mexican health care services. For medication purchases and doctor visits, the likelihood of utilization increased with higher levels of Spanish fluency.

Table 3: Odds Ratios of Ever Crossing the U.S.-Mexico Border for Health Care Services in Mexico

<i>Explanatory Variables</i>	<i>Purchase Medication</i>	<i>Visit a Doctor</i>	<i>Visit a Dentist</i>	<i>Have Inpatient Care</i>	<i>Have at Least One of the Four Types of Care</i>
Age	1.00 (0.99, 1.01)	0.97 (0.96, 0.99)***	1.02 (1.01, 1.03)***	1.00 (0.98, 1.02)	1.00 (0.99, 1.01)
Gender					
Male	Reference	Reference	Reference	Reference	Reference
Female	1.57 (1.20, 2.05)***	1.80 (1.32, 2.44)***	1.49 (1.14, 1.95)***	2.62 (1.32, 5.19)**	1.52 (1.17, 2.00)***
Race and ethnicity					
Non-Hispanics	Reference	Reference	Reference	Reference	Reference
Hispanics not born in Mexico	0.86 (0.49, 1.52)	0.91 (0.44, 1.91)	2.73 (1.53, 4.86)***	7.97 (0.25, 258.92)	1.06 (0.62, 1.80)
Hispanics born in Mexico	1.82 (0.98, 3.76)	1.80 (0.73, 4.36)	6.98 (3.31, 14.72)***	8.26 (0.23, 296.47)	3.36 (1.56, 7.25)**
Marital status					
Married	Reference	Reference	Reference	Reference	Reference
Single	1.13 (0.83, 1.55)	1.07 (0.76, 1.51)	1.35 (0.99, 1.83)	0.96 (0.50, 1.88)	0.97 (0.71, 1.34)
Divorced	2.42 (1.42, 4.11)***	1.52 (0.87, 2.68)	2.95 (1.80, 4.85)***	0.15 (0.02, 1.09)	2.05 (1.16, 3.63)*
Separated	1.12 (0.46, 2.69)	0.41 (0.15, 1.13)	1.04 (0.43, 2.51)	0.81 (0.20, 3.29)	0.47 (0.20, 1.14)
Widow(er)	0.41 (0.22, 0.75)**	1.50 (0.74, 3.03)	0.38 (0.21, 0.70)**	1.01 (0.35, 2.89)	0.81 (0.47, 1.40)
Citizenship status					
U.S. citizen	Reference	Reference	Reference	Reference	Reference
Non-U.S. citizen	0.81 (0.47, 1.40)	0.81 (0.45, 1.45)	0.53 (0.31, 0.91)*	1.25 (0.45, 3.45)	0.40 (0.21, 0.76)**
Fluency of Spanish					
Very good	Reference	Reference	Reference	Reference	Reference
Good	0.39 (0.29, 0.53)***	0.57 (0.41, 0.79)***	1.03 (0.77, 1.38)	0.67 (0.37, 1.22)	0.89 (0.65, 1.21)
Not good	0.47 (0.27, 0.82)**	0.10 (0.05, 0.23)***	1.06 (0.61, 1.85)	0.04 (0.00, 2.91)	0.58 (0.34, 0.99)*
Do not speak	0.21 (0.10, 0.42)***	0.01 (0.00, 0.04)***	0.88 (0.45, 1.74)	— ^a	0.27 (0.14, 0.52)***
Education					
Below high school	Reference	Reference	Reference	Reference	Reference
High school and higher	1.31 (0.94, 1.82)	0.89 (0.63, 1.28)	0.87 (0.63, 1.20)	2.25 (1.19, 4.25)*	0.74 (0.53, 1.05)
Annual household income (U.S.\$)					
< 10,000	Reference	Reference	Reference	Reference	Reference
10,000–19,999	1.04 (0.73, 1.48)	0.92 (0.62, 1.36)	1.43 (1.00, 2.05)*	1.19 (0.55, 2.58)	0.74 (0.51, 1.07)
20,000–49,999	1.09 (0.74, 1.60)	2.41 (1.55, 3.76)***	2.12 (1.45, 3.10)***	1.95 (0.86, 4.41)	1.16 (0.78, 1.73)
50,000–79,999	0.76 (0.46, 1.27)	2.01 (1.11, 3.66)*	1.37 (0.83, 2.30)	1.66 (0.45, 6.11)	0.86 (0.52, 1.41)

80,000–124,999	0.92 (0.46, 1.82)	2.08 (0.91, 4.73)	2.95 (1.56, 5.60)***	2.99 (0.61, 14.56) — ^a	1.08 (0.57, 2.07)
125,000 and above	0.63 (0.28, 1.42)	0.22 (0.06, 0.86)*	1.71 (0.77, 3.78)		0.67 (0.31, 1.46)
Health insurance status					
Insured	Reference	Reference	Reference	Reference	Reference
Uninsured	1.33 (0.98, 1.80)	2.16 (1.54, 3.03)***	0.70 (0.52, 0.94)*	1.70 (0.89, 3.25)	1.39 (1.02, 1.90)*
Self-rated health status					
Excellent	Reference	Reference	Reference	Reference	Reference
Very good	1.20 (0.79, 1.82)	1.18 (0.74, 1.90)	1.63 (1.08, 2.45)*	3.53 (0.86, 14.41)	1.33 (0.88, 2.00)
Good	1.22 (0.84, 1.77)	2.11 (1.38, 3.22)***	1.58 (1.08, 2.31)*	5.10 (1.33, 19.55)*	1.27 (0.88, 1.83)
Fair	1.42 (0.91, 2.19)	2.29 (1.38, 3.79)***	1.77 (1.45, 2.72)*	11.41 (2.88, 45.15)***	1.30 (0.84, 2.00)
Poor	0.84 (0.43, 1.65)	7.54 (3.59, 15.86)***	0.63 (0.30, 1.31)	16.02 (2.81, 91.49)***	0.99 (0.53, 1.84)
Satisfaction with health care received in the United States					
Very satisfied	Reference	Reference	Reference	Reference	Reference
Satisfied	1.24 (0.90, 1.70)	2.07 (1.44, 2.98)***	1.12 (0.81, 1.53)	0.64 (0.32, 1.29)	1.14 (0.84, 1.54)
Neutral	5.39 (3.54, 8.21)***	15.65 (9.56, 25.60)***	2.46 (1.66, 3.64)***	0.76 (0.32, 1.81)	3.75 (2.44, 5.76)***
Unsatisfied	2.99 (1.70, 5.26)***	2.75 (1.47, 5.14)**	1.61 (0.94, 2.75)	2.33 (0.90, 6.02)	7.23 (3.46, 15.09)***
Very unsatisfied	4.69 (2.34, 9.40)***	8.47 (3.83, 18.73)***	1.98 (1.00, 3.91)*	1.13 (0.27, 4.76)	2.16 (1.07, 4.35)*
Number of cases	1,342	1,342	1,341	1,342	1,342

Note. Numbers in the parentheses are 95% confidence intervals.

^aNo case reported.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

Source: The Cross-Border Utilization of Health Care Survey.

The results also revealed a close link between health insurance coverage in the United States and utilization of health care services in Mexico. Lack of health insurance coverage was associated with a higher probability of medication purchases and doctor visits but a reduced chance of visiting a dentist in Mexico. Relative to the insured, the odds of visiting a Mexican doctor and medication purchases were, respectively, 116 ($p < .001$) and 33 ($p = .07$) percent higher for those without health insurance, whereas the odds of visiting a Mexican dentist for the uninsured became 30 percent less ($p < .05$).

Educational attainment was positively associated with the odds of having utilized inpatient care in Mexico. Relative to respondents with an educational level below high school, the odds for those with a high school education or higher of having used inpatient care in Mexico were 225 percent as high ($p < .05$). The corresponding odds became 131 percent in the case of purchasing medications, although this effect is not statistically significant ($p > .05$).

The results also showed a gradient between self-rated health and the odds of visiting a Mexican doctor or having inpatient care in Mexico, with worse self-rated health monotonically corresponding to higher odds of utilizing these two types of services in Mexico. Relative to those who reported excellent self-rated health, the odds of visiting a Mexican doctor were 111 percent higher for those who rated their health to be good, 129 percent higher for fair health, and 654 percent higher for poor health ($p < .001$ in all three cases).

Dissatisfaction with the quality of health care received in the United States was associated with increased odds of obtaining health care services in Mexico. Compared with those who were very satisfied with the health care services received in the United States, the odds of medication purchases in Mexico for those who were very unsatisfied with U.S. health care were 369 percent higher ($p < .001$). Similar results were also found in the cases of visiting a Mexican doctor or dentist.

DISCUSSION

With the recent enactment of the Patient Protection and Affordable Care Act of 2010, which includes provisions to expand Medicaid and to subsidize health insurance premiums (Davis 2010), the issue of health care access and delivery in the U.S.–Mexico border area can be expected to gain increasing attention

mainly for three reasons. First, the four southwestern border states account for 30 percent of the total U.S. uninsured population, with uninsurance rates particularly high in border communities (Bastida, Brown, and Pagán 2008). Universal access to health care would become impossible without addressing the access issue in the U.S.–Mexico border region, one of the poorest and most underserved areas in the United States (U.S./Mexico Border Counties Coalition 2006). Although expansions in health insurance coverage resulting from the recently enacted health care reform legislation should partly reduce the dependence on Mexico for health care for the newly insured border-dwelling population, this will not be the case for border residents not covered by reform (e.g., some recent immigrants, particularly the undocumented).

Second, from an epidemiological perspective, the southwestern border area can serve as an important “buffer zone” if a major pandemic ever breaks out south of the border—the recent swine flu epidemic being a clear example of this potential threat. Given the high volume of daily inflows and outflows of people and goods across the U.S.–Mexico border, poor and inadequate access to health care on the U.S. side of the border certainly weakens the country’s ability to fend off these public health threats.

Third, the rapid increase in the size of the Hispanic population in the United States makes the health care preferences of this population particularly important. In 2008, Hispanics 18 years of age and older were 13.5 percent of the U.S. population in that age group, up from just 5.5 percent in 1980. Added to these statistics is the fact that 39 percent of persons of Mexican origin in the United States were uninsured in 2007, more than double the 17 percent rate for non-Hispanic whites (National Center for Health Statistics 2010). Effective formulations of health care policies call for a serious consideration of the size, the growth, and the large percent of uninsured among Mexican-origin residents of the United States.

Findings from this study provide further evidence that access to health care is alarmingly inadequate on the Texas side of the border (Texas Department of State Health Services 2009). Besides exceedingly high rates of uninsurance (47 percent in the sample), the unmet health care needs on the U.S. side of the border can also be illustrated by the finding that respondents with poor self-rated health status are more likely to utilize health care services in Mexico (after controlling for insurance status). A plausible explanation would be that individuals in poorer health also have greater health care needs, which in turn results in increasing health care utilization in Mexico if access to similar services on the U.S. side of the border is constrained. If U.S. health care seekers with poor health could access affordable health care on the U.S. side of

the border, presumably much fewer of them would take the trouble to cross the border to seek health care services in Mexico.

Results from our study also point to the importance of perceived quality of health care in the United States in accounting for utilization of health care services in Mexico. Regardless of health insurance status, dissatisfaction with the quality of health care in the U.S. motivates people on the U.S. side of the border to seek alternative health care resources. The dissatisfaction could result from the quality of health care *per se*, or it could be a result of language or cultural barriers that hamper access to care (Kirby, Taliaferro, and Zuvekas 2006). Thus, border health care consumers are particularly sensitive to the quality and the language and cultural competence of health care providers on the U.S. side of the border.

Several limitations of this study are noteworthy. First, the cross-sectional design of this study made it difficult for us to effectively address the issue of endogeneity associated with several explanatory variables and to reliably draw causal inferences. For instance, dissatisfaction with the quality of health services received on the U.S. side of the border could be a reason for as well as a result of utilizing health services in Mexico.⁴ Second, the information we collected on cross-border utilization of health care and its timing was based on the recall of the respondents. The degree of recall bias could potentially affect our findings. It would be valuable if future studies can compare our findings to those based on panel data and evaluate whether empirical results differ across these two study designs. Finally, the lower than ideal response rate (28.6 percent) in the telephone survey calls for caution when generalizing the findings from this study to the whole Texas border area. In particular, if response rates vary substantially by immigration status (e.g., documented versus undocumented), then our study may overestimate the use of health care services in Mexico by residents on the U.S. side of the border. Unfortunately, we do not have information on immigration status to address this concern. Nonetheless, we do know that relative to U.S. citizens, non-U.S. citizens in our sample were less likely to cross the border for most of the health services considered.

Despite these limitations, our study is relatively large in scale and our results provide several insights that are relevant for U.S. health policies in a border context. First, policies such as the recent Western Hemisphere Travel Initiative (that requires a U.S. passport or passport card for U.S. border residents returning to the United States) impose nontrivial economic and legal costs on border residents. Even U.S.-citizen border residents may curtail their use of Mexican medical services rather than undergo the costs and the scrutiny required to obtain these documents. To the extent that the Mexican health

care option is thus restricted for border residents, this may have an impact on their utilization of health care services on the U.S. side of the border given the greater unmet health care needs, particularly for low-income, uninsured U.S. residents.

A second policy implication is that a large-scale medical arrangement has evolved de facto without a clear understanding of its epidemiological consequences. Little is known about the quality and safety of health care received on the Mexican side of the border and the extent to which these services satisfy the medical needs of care seekers. Major health and health care consequences may be occurring at the macrolevel—all unrecognized by those who utilize the system. This would include, for example, the dangers of creating drug-resistant strains through mass overutilization of antibiotics purchased without a prescription and the possibility that the mass cross-border medical trade may contribute to the spread of a pandemic.

Finally, public health policy should more directly address the structural deficiencies of the U.S.–Mexico border health system. A large population faced with unaffordable health insurance coverage, few doctors, and very high medical costs are voting with their feet by going to Mexico to meet their health care needs. The high use of health care services in Mexico by Texas border residents highlights the need to establish a closer collaboration between the U.S. and Mexico to deal with health care delivery and access in the U.S.–Mexico border area. Cross-border utilization of health care has been largely informal and unsupported by health authorities on both sides of the border (Ruiz-Beltran and Kamau 2001). The vast majority of users of health services across the U.S.–Mexico border pay for these services out of pocket (Warner 2007). Cross-border health care users might be better served if, for example, they could obtain health insurance coverage for all of their health care needs regardless of the country in which the services are obtained. This can be an integral part of any future immigration reform discussions between the United States and Mexico (Bustamante, Ojeda, and Castaneda 2008).

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NOTES

1. "Blocks" of numbers are defined as groups of 100 consecutive telephone numbers whose area code and exchange and stem (i.e., the last four digits) are identical except for the last (rightmost) two digits (which range in value from 00 to 99). "Working blocks" denote all blocks for which at least one telephone number in the block is a listed residential telephone number.
2. Respondents who reported medication purchases in Mexico were also asked whether they bought the medications for themselves or for others and what kind of medications they purchased. About 81 percent of these respondents reported that they purchased the medications for their own use. The most common medications purchased were prescription drugs.
3. We replicated our analysis with and without using cases with imputed income. In general, our findings were not sensitive to the inclusion or exclusion of these cases.
4. To assess the sensitivity of our results to the use of this variable, we estimated the logistic regressions on utilizing health services in Mexico after removing the variable on satisfaction with the quality of health services received on the U.S. side of the border. Removing this variable did not significantly alter our results, as reported in Table 3.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

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